

REMARKS

Reconsideration and allowance of the subject application are respectfully requested.

Upon entry of this Amendment, claims 1 and 3-22 are pending in the application with claims 1 and 3-7 withdrawn from consideration as being directed to a non-elected invention. In response to the Office Action (Paper No. 10), Applicant respectfully submits that the pending claims define patentable subject matter.

The drawings are objected to because the Examiner maintains that Figures 10, 19 and 22-24 should be labeled "Prior Art". Along with this Amendment, Applicant is submitting a Proposed Drawing Correction wherein Figures 10, 19 and 22-24 are labeled "Prior Art". Accordingly, the Examiner is requested to remove the objection to the drawings.

The specification is objected to because the claims are referred to the specification on pages 4-9. By this Amendment, Applicant has amended the specification to remove the references the claims. Accordingly, the Examiner is requested to remove the objection to the specification.

Claims 8-22 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite due to minor errors in antecedent basis. By this Amendment, Applicant has amended claims 8, 14 and 16-18 to improve clarity. Accordingly, the Examiner is requested to remove the §112, second paragraph, rejection of record.

Claims 8-20 are rejected under 35 U.S.C. § 102(e) as being anticipated by Marriott (USP 6,386,253). Claims 21 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Marriott. Along with this Amendment, Applicant is submitting a verified English translation of

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the priority document, JP 11-43208. Marriot was filed in the United States on June 21, 1999 while the foreign priority date of the present application is February 22, 1999. Accordingly, the Examiner is requested to remove the rejections based on Marriot.

Claims 8-11, 14 and 16-19 are rejected under 35 U.S.C. § 102(b) as being anticipated by JP 8-332810 (hereafter "JP '810"). Claims 8-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '810 in view of JP 7-257111 (hereafter "JP '111").¹ Applicant respectfully submits that the claimed invention would not have been anticipated by or rendered obvious in view of JP '810 and/or JP '111.

The rejections in view of Japan '810 appear to be predicated on the Examiner's broad reading of claim 8 as not precluding a "multitude of relatively small ribs (protuberant portions) arranged over the entire top surface of the block as shown in figures 6a or 6c of Japan '810." However, JP '810 simply discloses a number of "fine irregularities" provided on the surface of each block for the purpose of breaking water films on a frozen road. Similarly, JP '111 simply discloses forming a plurality of "roughness" shapes 3a-3f over the whole periphery of the tire ground contact surface to achieve more tractive force or braking force on snowy or icy roads.

On the other hand, the present invention as recited in claims 8-11, 14 and 16-19 provides a unique block structure, in which "the height of the block gradually decreases toward the block end edge and also toward the central portion of the block" in order to make the distribution of

¹ In numbered paragraph 10 of the Office Action (page 5), the Examiner comments regarding Japan '111, but that reference is not identified in the rejection itself. Nonetheless, Applicant is assuming that the Examiner intended to reject claims 8-19 over Japan '810 in view of Japan '111.

ground contact pressure even, on the basis of the discovery that the ground contact pressure is significantly higher in the vicinity of the block end edge and the central portion of the block, as shown in Fig. 20A.

The Examiner appears to believe that the fine irregularities/notches disclosed in JP '810 and the roughness shapes disclosed in JP '111 are structurally and functionally the same as the unique sloped structure of the present claim 8-11, 14 and 16-19. However, Applicant respectfully submits that the Examiner's interpretation of the reference is untenable. That is, the block structures of the claimed invention and the cited references are different not only in structure (the unique sloped configuration vs. simple notches and roughness shapes) but also in function thereof (breaking water films and forming rough area for traction vs. equalizing the ground contact pressure).

Accordingly, Applicant respectfully submits that claims 8-19 should be allowable over JP '810 and JP '111 because the applied references, alone or combined, do not teach or suggest all of the features of the claims.

Claims 8-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kamegawa et al. (USP 5,503,208; hereafter "Kamegawa") in view of EP 875403 (hereafter "EP '403"). Claims 21 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kamegawa in view of EP '403 and Miyazaki (USP 6,138,728). Applicant respectfully submits that the claimed invention would not have been rendered obvious in view of Kamegawa, EP '403 and Miyazaki.

The Examiner admits that Kamegawa fails to teach or suggest “gradually decreasing the height of the block toward the block end edge”, as required by independent claim 8. For that deficiency, the Examiner relies on EP ‘403.

In Kamegawa, “the distance in radial direction from the outer surface of the tread to the bottom of the main groove at the intersect portion is made larger/smaller as the angle (of the groove intersect portion) becomes smaller/larger” (lines 42-50, column 2 of Kamegawa). However, Kamegawa does not address (or even mention) the problem of the ground contact pressure being significantly higher in the vicinity of the block end edge and the central portion of the block distribution, and thus, Kamegawa makes no description or suggestion of “gradually decreasing the height of the block toward the block end edge”. Note that no figures of Kamegawa show a block structure in which the height of the block gradually decreases toward the block end edge.

EP ‘403 and Miyazaki disclose a block structure in which a block end is chamfered. However, EP ‘403 and Miyazaki also fail to disclose or even suggest “gradually decreasing the height of the block toward the central portion of the block”. That is, EP ‘403 simply proposes chamfering the acute-angle end of a block at which end rigidity of the land portion is low. Similarly, Miyazaki simply proposes changing the curvature of chamfering in accordance with the distance from the center of gravity of the block, i.e., a larger amount of chamfering at a portion of lower rigidity in the land portion. In other words, both EP ‘403 and Miyazaki propose simply removing a vulnerable portion having low rigidity from a land portion.

On the contrary, as described above, the claimed invention is directed a block structure in which “the height of the block gradually decreases toward the block end edge and also toward the central portion of the block” in order to make the distribution of ground contact pressure even, on the basis of the discovery that the ground contact pressure is significantly higher in the vicinity of the block end edge and the central portion of the block distribution.

Further, since Kamegawa does not address that the ground contact pressure is significantly higher in the vicinity of a block end edge or the necessity of structurally modifying such a block end edge portion, and since the concept of equalizing the ground contact pressure, which is critical in the present case, is missing in EP ‘403 and Miyazaki, Applicant respectfully submits that one of ordinary skill in the art would not have been motivated to combine Kamegawa et al. with EP ‘403 and Miyazaki to produce the claimed invention. That is, the uniquely sloped structure of the claimed invention is not simple but based on the unique design as defined in claims 14, 16, 17 and 18. The distribution of ground contact pressure can be made even only when the surface configuration of a block satisfies such meticulous conditions. Simply combining Kamegawa with EP ‘403 and Miyazaki would not result in a structure that satisfies these conditions.

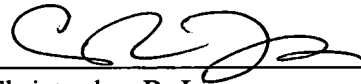
For the reasons described above, Applicant respectfully submits that claims 8-22 should be allowable over Kamegawa, EP ‘403 and Miyazaki since (1) the applied references, alone or combined, do not teach or suggest all of the features of the claims, and (2) one of ordinary skill in the art would not have been motivated to combine and modify the teachings of the applied references to produce the claimed invention.

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In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Page 4, the first full paragraph is amended as follows:

In order to solve the above-described problems, [the invention described in claim 1] there is provided a pneumatic tire in which a plurality of blocks demarcated by circumferential grooves extending in a circumferential direction of the tire and grooves intersecting the circumferential grooves, are provided on a tread, wherein at least a portion of a block edge is chamfered from the side of a block center to a groove wall surface of each of the blocks; a heightwise cross sectional form of a chamfer portion perpendicular to the groove wall surface is formed by a combination of a plurality of chamfer forms; and an angle formed by a tangential line of the chamfer portion with respect to a horizontal extension line of the surface of the block center in a heightwise cross section perpendicular to the groove wall surface increases from the side of the block center to the side of the block end.

Page 4, the second full paragraph is amended as follows:

The [invention described in claim 2 is characterized in that, in the invention described in claim 1, the] cross sectional form of the chamfer portion is provided such that the block central side thereof (a portion of the cross sectional form of the chamfer portion on the block central side) is formed as a straight line portion and the block end side thereof (a portion of the cross sectional form of the chamfer portion on the block end side) is formed by at least one curved line portion having a fixed curvature.

The paragraph bridging pages 4 and 5 is amended as follows:

The [invention described in claim 3 is characterized in that, in the invention described in claim 1 or claim 2, the] cross sectional form of the chamfer portion is comprised of two curved line portions having different curvatures.

Page 5, the first full paragraph is amended as follows:

[The invention described in claim 4 is characterized in that, in the invention described in any one of claims 1 to 3, when] When in the heightwise cross section perpendicular to the groove wall surface, a length of the chamfer portion measured along a horizontal extension line of the surface of the block central portion is represented by L1 and a likewise measured length of the block is represented by L0, the ratio L1/L0 is in the range from 0.02 to 0.3.

Page 5, the second full paragraph is amended as follows:

[The invention described in claim 5 is characterized in that, in the invention described in any one of claims 1 to 4, a] A distance, measured along a radial direction of the tire, between the horizontal extension line of the surface of the block central portion and an intersection point of the chamfer portion and the groove wall surface is in the range from 0.10 mm to 2.50 mm.

Page 5, the third full paragraph is amended as follows:

[The invention described in claim 6 is characterized in that, in the invention described in any one of claims 1 to 5, when] When a heightwise distance between a groove bottom of the block and the intersection point of the chamfer portion and the groove wall surface is represented by H1 and the maximum height of the block is represented by H0, the ratio H1/H0 is greater than or equal to 0.75 and less than 1.0.

The paragraph bridging pages 5 and 6 is amended as follows:

The [invention described in claim 7 is characterized in that, in the invention described in any one of claims 1 to 6, the] cross sectional form of the chamfer portion changes at a peripheral edge of the block for each portion of the block.

Page 6, the first full paragraph is amended as follows:

[The invention described in claim 8 is characterized in that, in the invention described in any one of claims 1 to 7, a] A peripheral protuberant portion is formed on a tread surface of the block in the vicinity of the end edge thereof in such a manner that the height of the block gradually decreases toward the block end edge and also toward the central portion of the block.

Page 6, the second full paragraph is amended as follows:

The [invention described in claim 9 is characterized in that, in the invention described in claim 8, the] peripheral protuberant portion is formed in at least both end edge portions of the block in the cross section of the block taken along the heightwise direction.

Page 6, the third full paragraph is amended as follows:

The [invention described in claim 10 is characterized in that, in the invention described in claim 8 or claim 9, the] peripheral protuberant portion is disposed in vicinities of the end edges at both sides of the block in the circumferential direction of the tire.

Page 6, the fourth full paragraph is amended as follows:

The [invention described in claim 11 is characterized in that, in the invention described in any one of claims 8 to 10, the] peripheral protuberant portion is disposed in vicinities of the end edges at both side of the block in the transverse direction of the tire.

Page 6, the fifth full paragraph is amended as follows:

[The invention described in claim 12 is characterized in that, in the invention described in any one of claims 8 to 11, a] A dimension HH1 measured along a radial direction of the tire, between an intersection point of a groove wall surface of the block and the peripheral protuberant portion, and a height position of a top of the peripheral protuberant portion is in the range from 0.1 to 2.5 mm.

Page 7, the first paragraph is amended as follows:

[The invention described in claim 13 is characterized in that, in the invention described in any one of claims 8 to 12, a] A dimension HH2 measured along the radial direction of the tire, between a maximum depth portion in a central region of the block and the height position of the top of the peripheral protuberant portion is in the range from 0.1 to 2.50 mm.

Page 7, the second paragraph is amended as follows:

The [invention described in claim 14 is characterized in that, in the invention described in any one of claims 8 to 13, the] ratio between the dimension HH1 measured along a radial direction of the tire, between an intersection point of a groove wall surface of the block and the peripheral protuberant portion, and a height position of a top of the peripheral protuberant portion, and the dimension HH2 measured along the radial direction of the tire, between a maximum depth portion in a central region of the block and the height position of the top of the peripheral protuberant portion, that is, $HH2/HH1$, is 1.5 or less.

Page 7, the third paragraph is amended as follows:

[The invention described in claim 15 is characterized in that, in the invention described in any one of claims 8 to 14, a] A dimension LL1 measured in a direction of the tread surface, between the intersection point of the groove wall surface of the block and the peripheral protuberant portion, and the top of the peripheral protuberant portion is 10.0 mm or less.

The paragraph bridging pages 7 and 8 is amended as follows:

[The invention described in claim 16 is characterized in that, in the invention described in any one of claims 8 to 15, with] With respect to the dimension LL1 measured in a direction along the tread surface between the intersection point of the groove wall surface of the block and the peripheral protuberant portion and the top of the peripheral protuberant portion, and a

dimension LL2 measured in the direction along the tread from the top of the peripheral protuberant portion to the maximum depth portion in the central region of the block, LL1/LL2 is 2.0 or less.

Page 8, the first full paragraph is amended as follows:

[The invention described in claim 17 is characterized in that, in the invention described in any one of claims 8 to 16, with respect] With respect to the dimension HH1 measured along a radial direction of the tire, between an intersection point of a groove wall surface of the block and the peripheral protuberant portion, and a height position of a top of the peripheral protuberant portion, and the dimension LL1 measured in a direction along the tread surface, between the intersection point of the groove wall surface of the block and the peripheral protuberant portion, and the top of the peripheral protuberant portion, HH1/LL1 is 1.0 or less.

Page 8, the second full paragraph is amended as follows:

[The invention described in claim 18 is characterized in that, in the invention described in any one of claims 8 to 17, with] With respect to the dimension HH2 measured along the radial direction of the tire between a maximum depth portion in a central region of the block and the height position of the top of the peripheral protuberant portion, and the dimension LL2 measured in the direction along the tread from the top of the peripheral protuberant portion to the maximum depth portion in the central region of the block, HH2/LL2 is 1.0 or less.

The paragraph bridging pages 8 and 9 is amended as follows:

The [invention described in claim 19 is characterized in that, in the invention described in any one of claims 8 to 18, the] ratio between the maximum height H_0 and the minimum height T_1 of the block, that is, T_1/H_0 is set in the range of $0.75 \leq T_1/H_0 < 1.0$.

Page 9, the first full paragraph is amended as follows:

The [invention described in claim 20 is characterized in that, in the invention described in any one of claims 8 to 19, the] peripheral protuberant portion is formed along an entire periphery of the end edge portion of the block.

IN THE CLAIMS:

The claims are amended as follows:

8. (Amended) A pneumatic tire [in which] comprising a tread including a plurality of blocks demarcated by circumferential grooves extending in a circumferential direction of the tire and grooves intersecting the circumferential grooves[, are provided on a tread],

wherein a peripheral protuberant portion is formed on a tread surface of [the] each block in the vicinity of [the] an end edge thereof in such a manner that the height of the block gradually decreases toward the block end edge and also toward [the] a central portion of the block.

14. (Amended) A pneumatic tire according to claim 8, wherein the ratio between [the] a dimension HH1 measured along a radial direction of the tire, between an intersection point of a groove wall surface of the block and the peripheral protuberant portion, and a height position of a top of the peripheral protuberant portion, and [the] a dimension HH2 measured along the radial direction of the tire, between a maximum depth portion in a central region of the block and the height position of the top of the peripheral protuberant portion, that is, $HH2/HH1$, is 1.5 or less.

16. (Amended) A pneumatic tire according to claim 8, wherein the ratio between [the] a dimension LL1 measured in a direction along the tread surface, between the intersection point of the groove wall surface of the block and the peripheral protuberant portion, and the top of the peripheral protuberant portion, and a dimension LL2 measured in the direction along the tread from the top of the peripheral protuberant portion to the maximum depth portion in the central region of the block, that is, $LL1/LL2$ is 2.0 or less.

17. (Amended) A pneumatic tire according to claim 8, wherein the ratio between [the] a dimension HH1 measured along a radial direction of the tire, between an intersection point of a groove wall surface of the block and the peripheral protuberant portion, and a height position of a top of the peripheral protuberant portion, and [the] a dimension LL1 measured in a direction along the tread surface, between the intersection point of the groove wall surface of the block

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and the peripheral protuberant portion, and the top of the peripheral protuberant portion, that is, HH1/LL1 is 1.0 or less.

18. (Amended) A pneumatic tire according to claim 8, wherein the ratio between [the] a dimension HH2 measured along the radial direction of the tire, between a maximum depth portion in a central region of the block and the height position of the top of the peripheral protuberant portion, and [the] a dimension LL2 measured in the direction along the tread from the top of the peripheral protuberant portion to the maximum depth portion in the central region of the block, that is, HH2/LL2 is 1.0 or less.